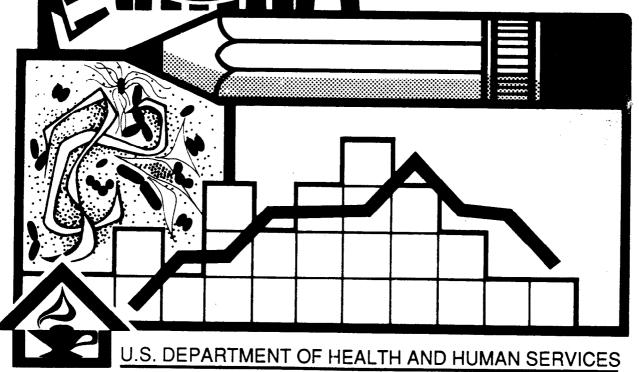


SELF-STUDY COURSE 3030-G

Principles of Epidemiology





SELF-STUDY

PUBLIC HEALTH SERVICE Centers for Disease Control Training and Laboratory Program Office Division of Training Atlanta, Georgia 30333 10/88:4R

PRINCIPLES OF EPIDEMIOLOGY

Self-Study Course 3030-G

LESSON 6: INVESTIGATION OF DISEASE OUTBREAKS

I: LESSON CONSISTS OF:

Part I: 34 multiple choice questions

II: PRIMARY REFERENCE:

Manual 6 - "Investigation of Disease Outbreaks".

NOTE: This manual is provided by CDC and should be included when you receive this lesson.

III: TOPICS AND READING ASSIGNMENTS:

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PRINCIPLES OF EPIDEMIOLOGY

Lesson 6

Objectives

Upon successful completion of Lesson 6, including the supplementary Epidemiologic Exercise, the student should be able to correctly:

- Investigate a suspected disease outbreak, using logical, orderly methods for confirming the existence of the outbreak, preparing epidemiologic reports, and identifying recommended control measures.
 - Characterize an epidemic by time, place, and person, when given epidemiologic data only.
 - Develop a hypothesis concerning the disease involved, the source, the mode of transmission of the agent, and the probable period of exposure to the source of the agent, when given epidemiologic data only.

PRINCIPLES OF EPIDEMIOLOGY

Lesson 6

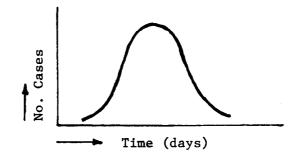
INVESTIGATION OF DISEASE OUTBREAKS

Part I: Multiple Choice

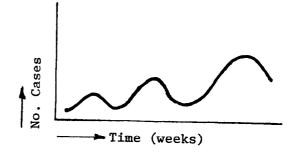
- 1. The main objective of an epidemic investigation is usually to:
 - A. Identify all infected persons.
 - B. Evaluate the efficacy of current control measures.
 - C. Determine the efficacy of a vaccine.
 - D. Identify ways to prevent further transmission of the agent.
- 2. Verified diagnoses of reported cases of a disease thought to be epidemic:
 - A. Can be made only by a physician.
 - B. Must be based on established case criteria.
 - C. Require laboratory confirmations.
 - D. "B" or "C" above.
- 3. An epidemic is most often confirmed by:
 - A. A current morbidity of more than ten cases per week.
 - B. A current morbidity rate that is significantly higher than usual.
 - C. Most laboratory specimens testing positive.
 - D. A verified diagnosis.
- 4. Characterizing an outbreak by time, place, and person is done mainly:
 - A. To find the facts that can lead to a hypothesis of the source of infection and the mode of transmission.
 - B. To find clues to the probable place of exposure.
 - C. To confirm that some particular population is at risk.
 - D. To identify situations in which secondary transmission is possible.
- 5. The source of infection and mode of transmission of an outbreak can be considered to have been conclusively identified when:
 - A. The epidemic has been characterized by selected variables of time, place, and person.
 - B. The investigator has established his or her hypothesis.
 - C. Additional information confirms the investigator's hypothesis.
 - D. The investigator can confirm that the index case was exposed to the suspected source.

- 6. The phrase "populations at highest risk of infection" is often used to describe groups of persons who have:
 - A. Never had the disease.
 - B. Particular behavior patterns.
 - C. A low level of resistence, whether it results from pre-existing disease, a naturally or artifically depressed immune response system, or some other cause.
 - D. Greatest susceptibility and greater likelihood of contact with the source of infection.
- 7. The objectives of an epidemiologic investigation:
 - A. Must be accomplished in the order given in the text.
 - B. Are intended to guide discussion of investigative techniques.
 - C. Indicate the sequence of logic in an investigation.
 - D. Both "B" and "C" above.
- 8. The data collected during an epidemiologic investigation should be related to:
 - A. The stage of the investigation.
 - B. The hypothesis being tested.
 - C. The objective the investigator is trying to reach.
 - D. The etiologic agent.
- 9. Whenever possible, diagnoses should be supported by laboratory tests because:
 - A. The clinical pictures of some diseases are neither specific nor unique.
 - B. Some species of etiologic agents are composed of subtypes, any of which might be responsible.
 - C. Some persons who have a disease may not have all the classic signs and symptoms.
 - D. All of the above.
- 10. When deciding whether or not there is an epidemic, the population assumed to be at risk is usually the population of the:
 - A. State from which the cases are reported.
 - B. City or county from which the cases are reported.
 - C. Geographic area or institution from which the cases are reported.
 - D. Age-, sex-, and place-specific group at highest risk.

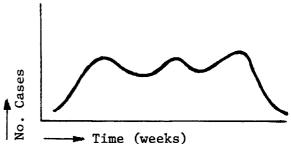
- 11. Which one of the following has no part in determining the current incidence of a disease?
 - A. Reviewing current case reports.
 - B. Identifying the past experience of the population at risk.
 - C. Looking for unreported cases and suspects.
 - D. Consolidating all available information on new cases.
- 12. An epidemic curve is a graph in which the cases of a disease occurring during an epidemic period are graphed according to their dates of:
 - A. Exposure.
 - B. Onset of illness.
 - C. Diagnosis.
 - D. Investigation.
- 13. The purpose of an epidemic curve is to:
 - A. Stimulate ideas about probable sources of infection.
 - B. Measure the incubation period of the disease.
 - C. Find out when the probable period of exposure was.
 - D. Both "A" and "C" above.
- 14. To obtain an appropriate graphing interval for an epidemic curve, you should multiply the average incubation period of the disease by which of the following?
 - A. Two or three
 - B. One
 - C. Between one-fourth and one-half
 - D. Between one-eighth and one-fourth
- 15. The cpidemic curve below probably represents cases caused by a:
 - A. Common source, exposure not lasting more than one day.
 - B. Common source and a few secondary cases.
 - C. Propagated source.
 - D. Common source, exposure lasting a week or longer.



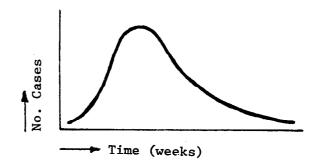
- 16. The epidemic curve below represents cases from a:
 - A. Common source, exposure not lasting more than one day.
 - B. Common source and a few secondary cases.
 - C. Propagated source.
 - D. Common source, exposure lasting a week or longer.



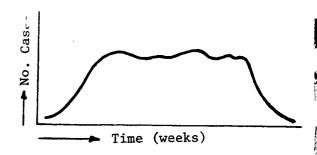
- 17. The epidemic curve below probably resulted from a:
 - A. Common source, exposure, not lasting more than one day.
 - B. Common source and a few secondary cases.
 - C. Propagated source.
 - D. A source, the nature of which cannot be determined with the available information.



- 18. The epidemic curve below probably resulted from a:
 - A. Common source, exposure not lasting more than one day.
 - B. Common source and a few secondary cases.
 - C. Common source, exposure lasting a week or longer.
 - D. A source, the nature of which cannot be determined with the available information.



- 19. The epidemic curve below probably resulted from a:
 - A. Common source and a few secondary cases.
 - B. Propagated source.
 - C. Common source, exposure lasting a week or longer.
 - D. A source, the nature of which cannot be determined with the available information.

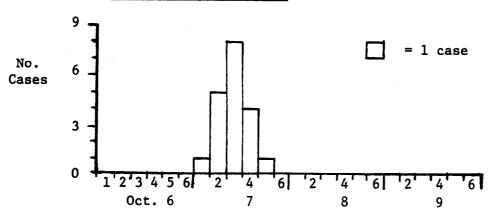


Use this Table for Problems 20, 21, and 22

Disease or	Incubation Periods									
Agent	Minimum	Average	Maximum							
C. perfringens	8 hrs.	10-12 hrs.	22 hrs.							
Leptospirosis	4 days	10 days	19 days							
Measles	8 days	10 days	13 days							

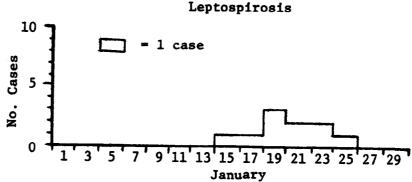
- 20. The probable period of exposure associated with the cases in the graph below is:
 - A. October 6, period #2
 - B. October 6, period #3
 - C. October 6, period #4
 - D. October 6, period #5

Clostridium perfringens



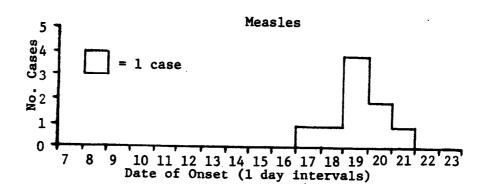
Date and time of onset (by 4 hour periods starting at 12:01 A.M. each day)

- 21. The probable period of exposure associated with the cases in the graph below is:
 - A. January 6-12.
 - B. January 5-6.
 - C. January 1-4.
 - D. December 30-31.



Date of Onset (by 2 day intervals that start on date shown in each interval)

- 22. The probable period of exposure associated with the cases in the graph below is:
 - A. February 27-28.
 - B. March 4-7.
 - C. March 2-4.
 - D. March 8-9.



- 23. The probable period of exposure can be difficult to ascertain from common source epidemic curves because:
 - A. Some of the cases could have been caused by a propagated source.

 B. Some cases could have been caused by a propagated source.
 - B. Some cases could have been exposed to one source, some to another.
 - C. The dates of onset of illness could be incorrect for some of the cases.
 - D. All of the above.

24. Which of the cases below could have resulted from exposure to another case in the same family? (Period from infection to onset of rash is 14-21 days; infectious period is one week before to four days after onset of rash.)

Family		Cases, by Date of Onset of Rash																					
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		# 1			#																		# 3
2				# 4								# 5										# 6	
3							# 7			# 8		# 9											
4	# 10					#				# 12													
5				# 13																			# 14

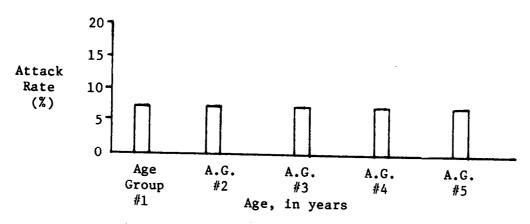
A. Cases 2, 5, 9, and 12

1

- B. Cases 3, 6, 9, 11, and 12
- C. Cases 3, 5, 6, 12, and 14
- D. Cases 6, 9, 11, and 14
- 25. The population at risk as defined by place is determined mainly:
 - A. To find the geographic limits of the outbreak.
 - B. To help find the source of infection and the mode of transmission.
 - C. To assign cases to investigators for follow-up.
 - D. To help decide what denominator data to use.
- 26. The geographic distribution of cases should be tabulated according to:
 - A. The residence of the case.
 - B. The place of usual occupation or school attended.
 - C. The place at which medical care services are received.
 - D. That variable of "place" that produces a meaningful pattern.

- 27. To assess the risk of infection according to "place," it is necessary to:
 - A. Prepare a spot map of the cases by a "place" variable that produces a meaningful pattern.
 - B. Interview a number of persons who have been selected to be controls.
 - C. Calculate incidence rates for component sites of various places.
 - D. Prepare an epidemic curve for cases in each different "place."
- 28. Early in the investigation of an outbreak of hepatitis-B, it was observed that there were no confirmed cases among young children, middle-aged persons, or elderly persons. Which of the following sets of age groups probably would be most useful in establishing a hypothesis regarding the source of infection and mode of transmission?
 - A. 0-4, 5-9, 10-19, 20-39, 40-59, 60+
 - B. 0-4, 5-14, 15-29, 30-49, 50-69, 70+
 - C. 0-14, 15-29, 30-34, 35-39, 40-44, 45-49, 50+
 - D. 0-9, 10-14, 15-19, 20-24, 25-29, 30+
- 29. If the data in the graph below are accurate and complete, what might explain the pattern observed?

Attack Rates of Disease X in a Community, by Age Group



- A. There is no age-specific difference in risk of this disease.
- B. The age groups selected could have masked true age-specific differences.
- C. The case criteria were inappropriate.
- D. Both "A" and "B" above.

- 30. According to the text, a hypothesis is:
 - A. An unproven statement.
 - B. A statement of fact.
 - C. A sufficient basis for describing a population at risk and for recommending control measures.
 - D. Easy to test.
- 31. The purpose of a hypothesis is to:
 - A. Serve as a substitute when the agent, source of infection and mode of transmission are obscure.
 - B. Act as a standard for evaluating control measures.
 - C. Be a basis for further investigation.
 - D. Both "A" and "C" above.
- 32. The primary reason for characterizing an outbreak is to find the source of infection and the mode of transmission. The intervening steps of forming and testing hypntheses require, in part:
 - A. Confirming or rejecting the diagnosis.
 - B. Calculating age- and sex-specific attack rates and deciding on the most reasonable explanation for the distribution of known cases.
 - C. Listing all plausible alternate hypotheses which do not require using all the information available for their formulation.
 - D. Deciding on the single most reasonable explanation for the observed time, place, and person characteristics.
- 33. A hypothesis about a source of infection and a mode of transmission can be considered confirmed if additional information obtained to test it discloses that:
 - A. There were more cases involved than originally expected.
 - B. Exposed persons had a significantly higher attack rate than persons who were not similarly exposed.
 - C. No other mode of transmission would have produced the distribution of known cases.
 - D. Both "B" and "C" above

34. According to the attack rate table below, the most reasonable hypothesis as to the vehicle of infection would name which one of the following foods as being responsible?

Attack Rates Among Persons Who Ate (Exposed) and Who Did Not Eat (Unexposed) Certain Foods

Food Items	Attack Rates/100						
T C C III S	Exposed Persons	Unexposed Persons					
Punch	89%	92%					
Rolled roast	76%	68%					
Chicken Jello and whipped	53%	59%					
cream	88%	21%					
Baked beans	49%	63%					

- A. Punch
- B. Rolled roast
- C. Chicken
- D. Jello and whipped cream

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